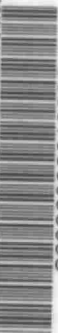


STANDARDS DEVELOPMENT BRANCH OMOE



36936000010233

W.Q. LIB
SAUBER R. (22)



THE

ONTARIO WATER RESOURCES

COMMISSION

WATER POLLUTION SURVEY

of the

TOWN OF HANOVER

COUNTY OF GREY

1968

TOWN OF HANOVER - 1968
COUNTY OF GREY

TD
380
.H36
1968
MOE

Copyright Provisions and Restrictions on Copying:

This Ontario Ministry of the Environment work is protected by Crown copyright (unless otherwise indicated), which is held by the Queen's Printer for Ontario. It may be reproduced for non-commercial purposes if credit is given and Crown copyright is acknowledged.

It may not be reproduced, in all or in part, for any commercial purpose except under a licence from the Queen's Printer for Ontario.

For information on reproducing Government of Ontario works, please contact ServiceOntario Publications at copyright@ontario.ca

TD
380
.H36
1968

Report on a water pollution
survey of the town of Hanover,
county of Grey.

80375

R E P O R T

on a

Water Pollution Survey

of the

TOWN OF HANOVER

County of Grey

November 1968

District Engineers Branch

Division of Sanitary Engineering

INDEX

<u>SECTION</u>	<u>PAGE NO.</u>
I INTRODUCTION	1
II GENERAL	1
(1) Location	1
(2) Drainage	2
III WATER USES	2
(1) Municipal Water Works	2
(2) Recreational	2
IV WATER POLLUTION	2
(1) Sanitary Waste Disposal	2
(2) Inlet Sewer	3
(3) Saugeen River	4
(4) Storm Sewer and Creek Outfalls	4
(5) Hanover Park	4
(6) Industrial Waste Disposal	4
(7) Refuse Disposal	5
V DISCUSSION	5
VI SUMMARY AND CONCLUSIONS	5
VII RECOMMENDATIONS	6
APPENDICES	
TABLES	
MAP	

ONTARIO WATER RESOURCES COMMISSION

REPORT

I INTRODUCTION

The purpose of this survey was to locate and record significant sources of water pollution within the Town of Hanover. Surveys of this nature are conducted routinely throughout the Province of Ontario by the OWRC and form a basis for evaluating any existing or potential sources of pollution.

Recommendations are made pertaining to pollution abatement and the Commission expects that corrective measures will be taken by offending parties. Where water works and pollution-control works or expansion to present facilities appear necessary, the Ontario Water Resources has a programme to aid in their construction and financing.

The appendices to the report include a tabulation of the sample results, an interpretation of the laboratory tests and a map of the area showing the sampling point locations.

II GENERAL

(1) Location

The Town of Hanover has a population of 4,985 (1968 Municipal Directory), and is located on Highway 4, near the western boundaries of the County of Grey, approximately 35 miles from the City of Owen Sound. Industry in the town is provided with an additional work-force from the neighbouring rural communities.

(2) Drainage

The south-central and western sections of the town drain to the flood-plain area of the Saugeen River via open ditches and creeks. The northern and eastern parts of town drain to the river by creeks and storm sewers.

III WATER USES

(1) Municipal Water Works

The town is served by a municipal water works system. Water is obtained from a spring-fed lake and a deep well. Chlorination is the only treatment provided. There have been taste and odour problems in the lake water in the past, and to determine a means of overcoming these problems a biological survey is being done.

(2) Recreational

Fishing in the Saugeen River is the major recreational use and the river-side park is a popular attraction.

IV WATER POLLUTION

(1) Sanitary Waste Disposal

Municipal sanitary sewers are provided for most of the town. There is a small section near the Neustadt Road area that is served by septic tank and tile field systems.

Sewage is directed to a conventional activated sludge water pollution control plant which is operated by the Hanover Public Utilities Commission. In normal flow, efficient treatment

is provided. When hydraulic overloading, due to storm-flows, occurs the process is disrupted and impairment of the stream probably occurs until the plant recovers. The necessity of continuous and adequate treatment is affirmed and the location and removal of the source of infiltration or storm-sewer connections to the sanitary sewers should receive priority. The infiltration study which was recently completed should provide this information.

Due to recurrent motor damage and increased maintenance at the WPCP the installation of improved screening facilities is planned.

(2) Inlet Sewer

In order to remove obstructions at the California Street sewer the pipe was broken at several clean-out locations. This sewer passes an area where flooding occurs during high water and flood waters have direct access to the WPCP. Also, heavy sewage flow increased by infiltration results in overflow of sewage at the clean-out locations. This over-flow reaches the Saugeen River by the creek shown in this report as creek "D". The impairment of the creek at the railway bridge downstream from the sewer breakages (sampling point location D-0.08) is indicated by the appended laboratory analyses. The sewage overflow is an apparent source of this contamination.

(3) Saugeen River

The results of the river samples were satisfactory. The average flow for the 1967 water year at a gauging station downstream from Hanover was 1,230 cubic feet per second. During the same period, from October 1966 to September 1967 the maximum and minimum flows were 10,200 cfs and 249 cfs respectively. This flow provides adequate dilution and the ability of the stream to assimilate acceptable waste discharges enables effective water pollution control.

(4) Storm Sewer and Creek Outfalls

Tabulation and description of the appropriate outfalls are appended. Significant pollution was found at the following locations:

- (1) D-0.25 W-1 - a 10" storm sewer at 6th Avenue
- (2) D-0.08, D-0.25, D-0.0 (creek "D" at the CPR Bridge, at 6th Avenue and at the mouth).

(5) Hanover Park

The washroom facilities located under the band-shell in the park have a direct discharge to the river. A fluorescein dye placed in a water closet fixture showed in the river within 5 minutes. There is an apparent problem of elevation which would necessitate pumping to the nearest available sanitary sewer. However, alternate sewage disposal facilities for these washrooms should be adopted immediately.

(6) Industrial Waste Disposal

Industrial waste problems in the town are minimal and connections to the sanitary sewers are provided to the major

industries. The only major industrial waste problem at the WPCP is from the Swift Canadian Poultry Processing Plant. Improved in-plant supervision of the screens at Swifts would be appropriate. Apparently, the bucket screens are carelessly dumped into the sanitary sewer and the excess solids are causing maintenance difficulties at the sewage plant.

The Industrial Waste Division of this Commission will be investigating this problem.

(7) Refuse Disposal

The dump site at Lot 68 Concession 1 Township of Brant is operated by the town. Pollution problems do not appear imminent.

V DISCUSSION

Presently, water pollution control facilities in Hanover are capable of providing adequate treatment and in dry weather flow the plant effluent indicates efficient operation. Infiltration of storm water in the sanitary sewers disrupts this treatment. The recommendations resulting from the recent infiltration study should be implemented in order to prevent access of storm water to the plant.

The recently completed Official Plan should provide guide lines for the provision of water and sewage facilities to satisfy projected development.

VI SUMMARY AND CONCLUSIONS

A water pollution survey of the Town of Hanover was done during July and September, 1968. The survey confirmed the necessity

of controlling the access of surface water to the sanitary sewers. Also, breaks in the California Street influent sewer should be repaired and illegal discharges to the storm sewers or watercourses should be located and directed to the sanitary sewer.

VII RECOMMENDATIONS

(1) Sources of infiltration of storm water to the sanitary sewers should be located and redirected to appropriate storm sewers.

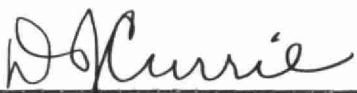
(2) The breaks in the California Street influent sewer should be repaired.

(3) The sources of pollution at the 10-inch corrugated storm sewer (D-0.25W) should be located and directed to the sanitary sewer.

(4) All wash-room facilities at the Hanover Park should be directed to the sanitary sewer.

/elc

Prepared by:


D.J. Currie, Technician,
Div. of Sanitary Engineering.

APPENDIX

EXPLANATION AND SIGNIFICANCE OF LABORATORY ANALYSES

A Bacteriological Examination

Bacteriological examinations were performed on samples from the watercourse. The Membrane Filter technique was used to obtain a direct enumeration of coliform organisms. These organisms are normal inhabitants of the intestines of man and other warm blooded animals. They are always present in sewage and are generally minimal in other pollutants. The results of the examinations are reported as M.F. Coliform count per 100 ml.

The Commission's objective for surface waters in Ontario is a coliform count of not greater than 2,400 organisms per 100 ml.

B Chemical Analysis

The chemical analysis performed on stream and outfall samples included determinations for biochemical oxygen demand, suspended solids and in some instances turbidity.

(1) Biochemical Oxygen Demand (BOD)

Biochemical oxygen demand is reported in ppm and is an indication of the amount of oxygen required for stabilization of decomposable organic matter present in sewage, polluted waters or industrial wastes. The completion of the test requires five days, under the controlled incubation temperature of 20°C.

The Commission's water quality objectives are (1) for stream water - a 5-day BOD of not greater than 4 ppm. (11) for

storm sewer, sewage treatment plant and industrial waste discharges
- a 5-Day BOD of not greater than 15 ppm.

(2) Solids

The laboratory does tests to determine the total and suspended solids in a sample. The value for dissolved solids is determined by taking the mathematical difference between the total and suspended solids.

The concentration of suspended solids expressed in parts per million (ppm) is generally the most significant of the solids analyses in regard to stream water and outfall discharge qualities.

The OWRC's objective for discharge is a suspended solids concentration of not greater than 15 ppm.

(3) Turbidity

Turbidity is caused by the presence of suspended matter such as clay, silt, finely divided organic matter, plankton and other microscopic organisms in water or outfall discharges. It is an expression of the optical property of a sample and the results are reported in "Turbidity Units".

(4) Phenolic Compounds

Phenols and phenolic equivalents were measured by the Gibbs method with modifications. Phenols react with chlorine to produce intensely aromatic compounds. These compounds, even when highly diluted, may give taste and odour to the water which is variously described as medicinal, chemical or iodoform. Phenols

taint fish and are toxic to fish, depending on the concentration. Normal water contains no phenolic compounds.

(5) Alkyl-Benzene Sulfonate (ABS)

The alkyl benzene sulfonate portion of the anionic detergents is reported in ppm. The test is generally employed to detect the presence of domestic wastes. The popular use of synthetic detergents for general cleaning purposes has resulted in the incidence of residual ABS in domestic waste discharges.

(6) Oils and Ether Solubles

These include oil and all other ether soluble materials such as tarry substances and greases. The presence of these pollutants renders water difficult and sometimes impractical to treat, either for industrial or domestic use.

ABBREVIATIONS

cfs	--- cubic feet per second
WPCP	--- water pollution control plant
ppm	--- parts per million
ppb	--- parts per billion
ML	--- millilitre

TOWN OF HANOVER

1968 WATER POLLUTION SURVEY

TABLE NO. 1 LABORATORY RESULTS

RIVER SAMPLES

SAMPLE POINT	DESCRIPTION	DATE	5-DAY BOD (PPM)	SOLIDS			ANIONIC DETERGENTS		APPARENT COLOUR UNITS	TURBIDITY UNITS	COLIFORMS	
				TOTAL (PPM)	SUSP. (PPM)	DISS. (PPM)	AS	ABS (PPM)			PER	100 ML
S-59.13	SAUGEEN RIVER AT WESTERN BOUNDARY.	JULY 11/68	0.7	314	14	300		0.0	-	-		380
		SEPT. 20/68	0.8	290	4	286		0.0	60	4.0		92
S-59.38	SAUGEEN RIVER - DOWNSTREAM FROM WPCP.	JULY 11/68	1.6	308	6	302		0.5	-	-		<4
		SEPT. 20/68	0.7	302	3	299		0.0	50	3.3		176
S-59.8	SAUGEEN RIVER AT COUNTY ROAD BRIDGE.	JULY 11/68	1.1	286	5	281		-	-	-		12
		SEPT. 20/68	0.6	322	4	318		0.0	50	2.6		116
S-60.3	SAUGEEN RIVER AT CPR BRIDGE.	JULY 11/68	1.3	300	6	294		-	-	-		12
		SEPT. 20/68	0.5	312	4	308		0.0	50	2.5		160

TOWN OF HANOVER

DITCH AND STORM SEWER OUTFALLS

TABLE NO. 2

SAMPLE POINT	DESCRIPTION	DATE	5-DAY BOD (PPM)	SOLIDS		ANIONIC DETERGENTS AS ABS (PPM)	PHENOLS		ETHER SOLUBLES	COLIFORMS	
				TOTAL (PPM)	SUSP. (PPM)		IN	PPB		PER	100 ML
D-0.0=D	DITCH "D" AT OUTFALL TO SAUGEEN RIVER.	JULY 11/68	2.9	520	18	502	0.1	-	-	7,000	
		SEPT.20/68	1.0	394	6	388	0.0	-	-	3,700	
D-0.08	DITCH "D" AT CPR BRIDGE.	JULY 11/68	4.2	624	24	600	0.0	-	-	18,000	
		SEPT.20/68	1.3	564	12	552	0.1	-	-	21,000	
D-0.25	DITCH "D" AT 6TH AVENUE BRIDGE.	JULY 11/68	0.4	800	3	797	0.1	-	-	15,000	
		SEPT.20/68	0.6	536	7	529	0.0	-	-	140,000	
D-0.25=W1	10" CORRUGATED STORM SEWER-SOUTHEAST SIDE OF 6TH AVENUE BRIDGE.	JULY 11/68	1500	706	68	638	2.0	40	27	29,000,000	
		SEPT.20/68	0.8	832	5	827	0.0	-	-	82,000	
D-0.25=W3	8" CORRUGATED STORM SEWER NORTHEAST OF 6TH AVENUE.	JULY 11/68	2.4	544	16	528	0.1	-	-	170	
		SEPT.20/68	NO FLOW								
D-0.25I	OUTFALL FROM GATEMANS' ICE HOUSE.	JULY 11/68	0.4	466	2	464	0.0	-	-	<4	
		SEPT.20/68	0.4	402	2	400	0.0	-	-	4	
B-2=W	12" CLAY OUTFALL TO RAILWAY DITCH.	JULY 11/68	0.6	468	3	465	0.0	-	-	140	
		SEPT.20/68	0.5	422	4	418	0.0	-	-	132	
S-59.66W	10" CLAY TILE - OUTFALL TO TAILRACE REAR OF WATER WORKS.	JULY 11/68	0.4	2108	2	2106	0.0	-	-	20	
		SEPT.20/68	0.4	2114	6	2108	0.0	-	-	4	

TOWN OF HANOVER

ANALYSIS - SAUGEEN RIVER

September 19, 1968

<u>Sample No.</u>	<u>Hardness as CaCO₃ (ppm)</u>	<u>Alkalinity as CaCO₃ (ppm)</u>	<u>Iron as Fe (ppm)</u>	<u>Chloride as Cl (ppm)</u>	<u>Apparent Colour Units</u>	<u>Turbidity Units</u>
R-11618	246	222	0.21	12	8.5	2.1

Sample taken from Saugeen River at County Road.

TABLE NO. 2 (CONTD.)

SAMPLE POINT	DESCRIPTION	DATE	5-DAY BOD (PPM)	SOLIDS			ANIONIC DETERGENTS		PHENOLS		ETHER SOLUBLES	COLIFORMS	
				TOTAL (PPM)	SUSP. (PPM)	DISS. (PPM)	AS	ABS (PPM)	IN	PPB		PER	100 ML
D-0.78	DITCH AT 10TH AVENUE AND 8TH STREET.	JULY 11/68	1.2	518	4	514		0.0	-	-			1,100
		SEPT.20/68	1.0	820	4	816		0.1	-	-			4,700
D-1.0-W	30" CONCRETE STORM SEWER TO DITCH "D".	JULY 11/68	NO FLOW										
		SEPT.20/68	NO FLOW										
D-1.0-W1	10" CORRUGATED STORM SEWER TO DITCH "D".	JULY 11/68	NO FLOW										
		SEPT.20/68	NO FLOW										
S-60.13-W	30" STORM SEWER OUTFALL TO OPEN DITCH TO SAUGEEN RIVER (NORTH END OF 16TH AVENUE).												
		JULY 11/68	0.4	430	3	427		0.0	-	-			100
		SEPT.20/68	0.4	408	3	405		0.0	-	-			264
R-2-W	36" CONCRETE STORM SEWER - WEST OF 5TH AVENUE TO OPEN FLAT.	JULY 11/68	1.0	552	13	539		0.0	-	-			400
		SEPT.20/68	1.8	838	16	822		0.0	-	-			3,700

TOWN OF HANOVER

WATER QUALITY MONITORING STATIONS

TABLE NO. 3

RIVER BASIN - SAUGEEN			R. STREAM - SAUGEEN			R. STATION NUMBER - 3			STREAM MILEAGE S 58.8			STATION TYPE 2						
			SAMPLE POINT DESCRIPTION - HIGHWAY 4															
SAMPLE DATE			COLIFORM	WATER		5-DAY	SUSP.		COND.			AMMONIA	TOT.	NITRITE	NITRATE			
DA	MO	YR	MF/100 ML	TEMP.	DO	BOD	T. SOL.	SOL.	TURB.	25C	T. PO4	S. PO4	NH3-N	KJEL.	NC2-N	NC3-N		
				CENT.	(PPM)	(PPM)	(PPM)	(PPM)	UNITS	UMHOS	(PPM)	(PPM)	(PPM)	(PPM)	(PPM)	(PPM)		
8	11	66	10,100	3.5	9.0	1.7	276.	15.	4.5	464.0	0.10	0.04	0.16	0.46	0.01	0.45		
7	12	66	28,000	5.0	12.0	4.8	304.	42.	23.0	402.0	0.20	0.02	0.08	0.58	0.01	0.50		
2	1	67	1,370	5.0	12.0	0.9	274.	4.	1.8	453.0	0.04	0.02	0.10	0.65	0.00	0.72		
6	2	67	9,000	5.0	11.0	1.2	302.	15.	2.6	492.0	0.00	0.00	0.10	0.58	0.00	0.80		
6	3	67	8,000	5.0	12.0	1.2	258.	2.	2.9	570.0	0.08	0.02	0.13	0.43	0.00	1.00		
3	4	67	1,000	7.0	12.0	1.3	220.	26.	23.0	292.0	0.10	0.00	0.06	0.58	0.01	0.40		
1	6	67	100	15.0	10.0	1.1	292.	15.	1.3	415.0	0.10	0.08	0.20	0.58	0.01	0.70		
5	7	67	2,100	15.0	10.0	0.9	246.	15.	5.0	400.0	0.11	0.02	0.12	0.71	0.01	0.20		
3	8	67	16,000	16.0	9.0	2.8	308.	10.	17.0	424.0	0.23	0.06	0.33	0.52	0.00	0.54		
7	9	67	125,000	13.0	9.0	1.6	306.	7.	2.8	435.0	0.13	0.12	0.16	0.58	0.02	0.25		
2	5	67	810	12.0	9.0	0.6	262.	15.	6.0	443.0	0.04	0.05	0.16	0.52	0.00	0.50		

TOWN OF HANOVER

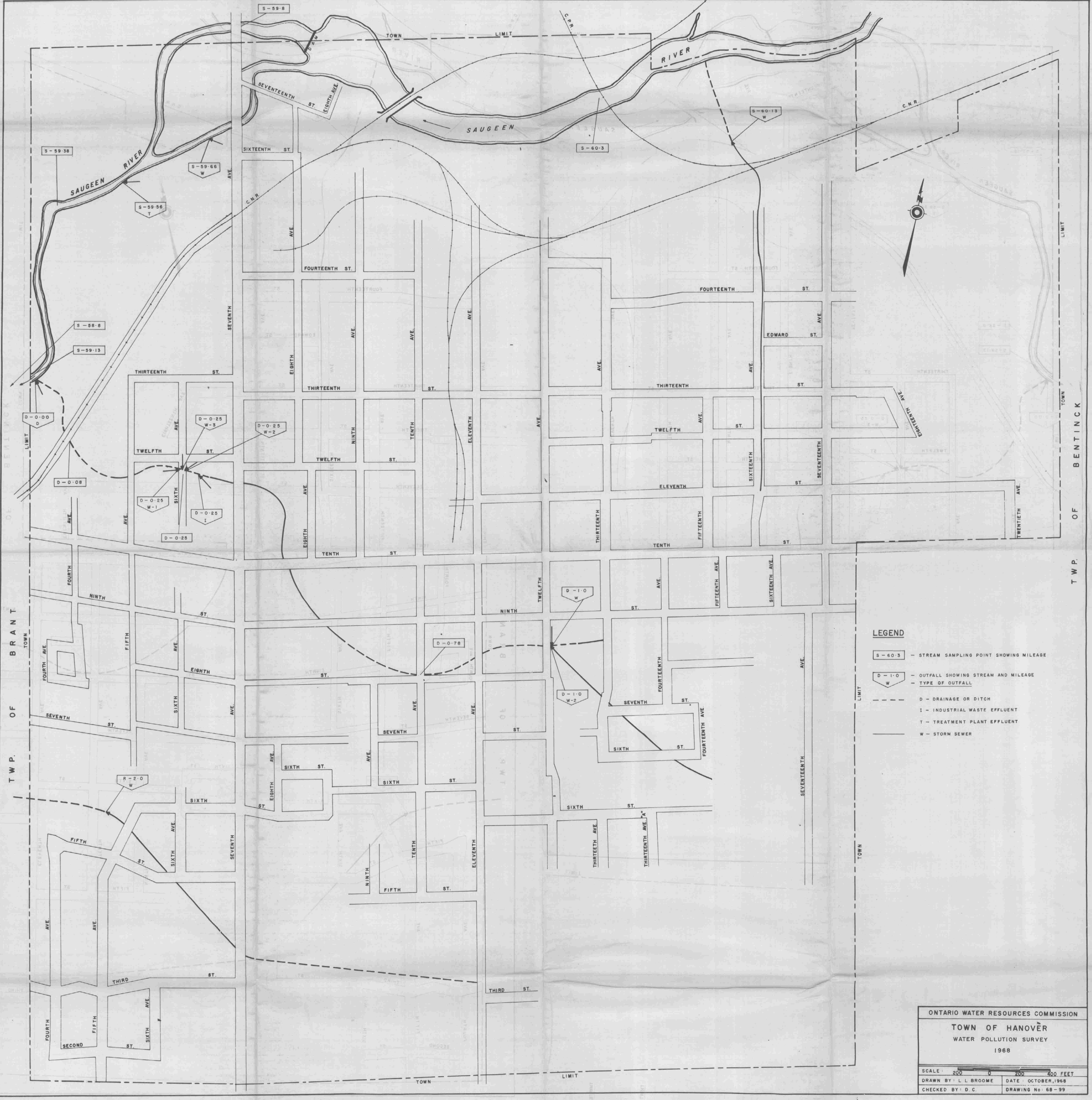
WATER QUALITY MONITORING STATIONS

TABLE NO. 3 (CONTD)

DATE			MF	5-DAY		SUSP.	COND.				NITROGEN AS N				CHL.	HARD. AS	ALK. AS	IRON	
DA	MO	YR	COLIFORMS	BOD	T. SOL	SOL.	UMHOS	TURB.	T. PO4	S PO4	FREE	TOTAL		AS CL.	CAC03	CAC03	AS FE	PH	
			PER 100 ML	(PPM)	(PPM)	(PPM)	PER CM3	UNITS	(PPM)	(PPM)	AMMONIA	KJEL.	NITRITE	NITRATE	(PPM)	(PPM)	(PPM)	(PPM)	
13	12	67	860	1	316	63	348	40.0	0.14	0.04	0.08	0.71	.007	0.80	6				
17	1	68	7,300	1.1	358	15	489	4.0	0.11	0.05	0.33	0.64	.006	0.60	8				
22	2	68	116	0.7	370	7	520	2.8	0.12	0.03	0.26	0.64	.010	0.60	6				
18	3	68	120	3.2	284	16	430	8.0	0.13	0.01	0.08	0.71	.012	0.54	6	222	212	0.58	8.1
25	3	68	144	1.1	254	4	394	2.9	0.10	0.03	0.16	0.52	.005	0.68	5	218	203	0.20	8.2
15	4	68	6,700	1.8	270	9	390	7.5	.08	0.01	0.07	0.47	.005	0.91	6				
21	5	68	148	3.2	290	13	412	20.0	0.07	0.03	0.15	0.94	.009	.631	6				
19	6	68	384	1.2	286	10	448	4.0	0.17	0.04	0.02	0.58	.008	0.37	8				
23	7	68	83,000	1.4	280	4	455	3.1	**	0.11	0.29	1.24	.013	0.19	7	242	218	0.50	8.1
26	8	68	11,000	3.2	266	15	362	8.5	0.20	0.01	0.33	1.28	.023	0.31	6				

** SAMPLE EXHAUSTED.

THE ABOVE RESULTS ARE COMPILED BY THE WATER QUALITY SURVEYS BRANCH OF THE DIVISION OF SANITARY ENGINEERING. THERE IS A REGULAR SAMPLING POINT ON THE SAUGEEN RIVER AT HIGHWAY 4, DOWNSTREAM FROM HANOVER. THIS LOCATION IS SAMPLED ONCE PER MONTH AND THE APPROPRIATE RESULTS WHICH ARE RECORDED ABOVE CONFIRM THE GENERALLY ACCEPTABLE WATER QUALITY OF THE RIVER IN THE HANOVER AREA. THE SPORADIC INCREASE IN COLIFORM ORGANISMS ARE PROBABLY RELATED TO THE TIMES OF HEAVY FLOW WHEN INFILTRATION OF STORM WATER TO THE WATER POLLUTION CONTROL PLANT INTERFERES WITH THE TREATMENT.



LEGEND

- S - 60-3 - STREAM SAMPLING POINT SHOWING MILEAGE
- D - 1-0 - OUTFALL SHOWING STREAM AND MILEAGE
- W - TYPE OF OUTFALL
- D - DRAINAGE OR DITCH
- I - INDUSTRIAL WASTE EFFLUENT
- T - TREATMENT PLANT EFFLUENT
- W - STORM SEWER

ONTARIO WATER RESOURCES COMMISSION

TOWN OF HANOVER

WATER POLLUTION SURVEY

1968

SCALE: 200 0 200 400 FEET

DRAWN BY: L. L. BROOME DATE: OCTOBER, 1968

CHECKED BY: D. C. DRAWING No: 68-99